

Claims

Sub B16
1. An on-press recording type lithographic printing method comprising mounting a plate material on a plate cylinder of a press, ejecting an oil-based ink onto the plate material from a recording head having a plurality of ejection channels utilizing an electrostatic field according to signals of image data to directly form an image on the surface of the plate material and prepare a printing plate, and then effecting the lithographic printing using the printing plate as it is,

10 wherein the distance of the ejection channels is 170 μm or more (150 dpi (150 dots per inch) or less as calculated in terms of resolution of recorded image).

2. The on-press recording type lithographic printing method according to Claim 1, wherein said oil-based ink is a dispersion comprising resin particles which are solid and hydrophobic at least at ordinary temperature dispersed in a nonaqueous solvent having an inherent electrical resistance of $10^9 \Omega\text{-cm}$ or more and a dielectric constant of 3.5 or less.

20 3. An on-press recording type lithographic printing apparatus comprising an image forming means for directly forming an image onto a plate material mounted on a plate cylinder of a press by using an ink jet recording device which ejects an oil-based ink from a recording head having a plurality of ejection channels

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wherein image forming means includes the recording head.

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20 6. The on-press recording type lithographic printing
apparatus according to any one of Claims 3 to 5, wherein said image
forming means includes plate material surface dust removing means
for removing dust present on the surface of the plate material
before and/or or during the recording of an image on the plate
25 material.

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7. The on-press recording type lithographic printing apparatus according to any one of Claims 3 to 6, wherein said image forming means carries out main scanning by rotations of the plate cylinder mounted on the plate material.

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8. The on-press recording type lithographic printing apparatus according to Claim 7, wherein said ink jet recording device carries out subscanning by the recording head approaching and separating in an axial direction of said plate cylinder when recording an image on said plate material.

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9. The on-press recording type lithographic printing apparatus according to any one of Claims 3 to 8, wherein said ink jet recording device includes ink supplying means for supplying the oil-based ink into the recording head.

10. The on-press recording type lithographic printing apparatus according to Claim 9, further comprising ink recovering means for recovering the oil-based ink from the recording head, wherein ink circulation is carried out by the ink supplying means and the ink recovering means.

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11. The on-press recording type lithographic printing apparatus according to any of Claims 3 to 10, further comprising ink stirring means in an ink tank housing the oil-based ink.

5 12. The on-press recording type lithographic printing apparatus according to any of Claims 3 to 11, further comprising ink temperature controlling means for controlling the temperature of the ink in the ink tank housing the oil-based ink.

10 13. The on-press recording type lithographic printing apparatus according to any one of Claims 3 to 12, further comprising an ink concentration controlling means for controlling the concentration of the ink.

15 14. The on-press recording type lithographic printing apparatus according to any of Claims 3 to 13, wherein said ink jet recording device includes recording head approaching and separating means for moving the recording head away from the plate cylinder except when recording the image on the plate material.

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15. The on-press recording type lithographic printing apparatus according to any of Claims 3 to 14, wherein said image forming means includes recording head cleaning means for cleaning the recording head at least after the termination of plate making.

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16. The on-press recording type lithographic printing apparatus according to any of Claims 3 to 15, wherein said lithographic printing means includes paper dust removing means for removing paper dust during lithographic printing.

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17. A plate making method comprising directly forming an image on a plate material and preparing a printing plate by recording using an ink jet method which ejects an oil-based ink from a recording head having a plurality of ejection channels according to signals of image data utilizing an electrostatic field, a lithographic printing means for effecting a lithographic printing using a printing plate formed by said image forming means,

wherein the formation of the image onto the plate material is carried out by the recording head having the distance of the ejection channels being 170 μm or more (150 dpi (150 dots per inch) or less as calculated in terms of resolution of recorded image).

18. The plate making method according to Claim 17, wherein said oil-based ink is a dispersion comprising resin particles which are solid and hydrophobic at least at ordinary temperature dispersed in a nonaqueous solvent having an inherent electrical resistance of $10^9 \Omega\text{-cm}$ or more and a dielectric constant of 3.5 or less.

19. A plate making apparatus comprising image forming means for directly forming an image on a plate material by an ink jet

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recording device which ejects an oil-based ink from a recording head having a plurality of ejection channels according to signals of image data utilizing an electrostatic field,

wherein the formation of the image onto the plate material is carried out by the recording head having the distance of the ejection channels being 170 μm or more (150 dpi (150 dots per inch) or less as calculated in terms of resolution of recorded image).

20. The platemaking apparatus according to Claim 19, wherein said oil-based ink is a dispersion comprising resin particles which are solid and hydrophobic at least at ordinary temperature dispersed in a nonaqueous solvent having an inherent electrical resistance of $10^9 \Omega\text{-cm}$ or more and a dielectric constant of 3.5 or less.

21. The plate making apparatus according to Claim 19 or 20, wherein said image forming means includes a device for fixing the ink.

22. The platemaking apparatus according to any one of Claims 19 to 21, wherein said image forming means includes plate material surface dust removing means for removing dust present on the surface of the plate material before and/or or during the recording of an image on the plate material.

23. The plate making apparatus according to any one of

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 Claims 19 to 22, wherein the image is recorded by causing a printing medium to move by rotating the drum having the plate material mounted thereon when recording an image on the plate material.~~

5 24. ~~B
 wherein the image is recorded by causing the recording head to move in an axial direction of said drum.~~

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 25. The plate making apparatus according to any one of
 10 Claims 19 to 22, wherein when recording the image on the plate material, subscanning is carried out by causing said plate material to move with the same pinched by at least a pair of capstan rollers.~~

15 26. The plate making apparatus according to Claim 25, wherein said recording head is moved in the direction orthogonal to a traveling direction of said plate material.

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 27. The plate making apparatus according to any one of Claims 19 to 26, wherein said ink jet recording device includes ink
 20 supplying means for supplying the oil-based ink into the recording head.~~

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 28. The plate making apparatus according to Claim 27, further comprising ink recovering means for recovering the oil-based ink
 25 from the recording head,~~

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where ^{1/B} the ink circulation is carried out.

A7> 29. The platemaking apparatus according to any one of Claims 19 to 28, wherein the ink jet recording device includes ink stirring means for stirring the oil-based ink in the ink tank housing the oil-based ink.

30. The platemaking apparatus according to any one of Claims 19 to 29, wherein the ink jet recording device includes ink temperature controlling means for controlling the temperature of the oil-based ink in the ink tank housing the oil-based ink.

31. The platemaking apparatus according to any one of Claims 19 to 30, wherein the ink jet recording device includes ink concentration controlling means for controlling the concentration of the oil-based ink.

32. The platemaking apparatus according to any one of Claims 19 to 31, further comprises cleaning means for cleaning the recording head.

Sub B²³ 33. A printing method comprising directly forming an image onto a printing medium and producing a print by an ink jet method which ejects an oil-based ink from a recording head having a ^{1/B}

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plurality of ejection channels according to signals of image data utilizing an electrostatic field,

wherein the formation of the image onto the printing medium is carried out by the recording head having the distance the image forming means includes the recording head having the distance of the ejection channels being 170 μm or more {150 dpi (150 dots per inch) or less as calculated in terms of resolution of recorded image}.

34. The ink jet printing method according to Claim 33, wherein said oil-based ink is a dispersion comprising color particles which are solid and hydrophobic at least at ordinary temperature dispersed in a nonaqueous solvent having an inherent electrical resistance of $10^9 \Omega\text{-cm}$ or more and a dielectric constant of 3.5 or less.

35. A printing apparatus comprising image forming means for directly forming an image onto a printing material by an ink jet recording device which ejects an oil-based ink from a recording head having a plurality of ejection channels according to signals of image data utilizing an electrostatic field,

wherein the formation of the image onto the printing medium is carried out by the recording head having the distance the image forming means includes the recording head having the distance of the ejection channels being 170 μm or more {150 dpi (150 dots per

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inch) or less as calculated in terms of resolution of recorded image}).

36. ^B The printing apparatus according to Claim 35, wherein
 5 said oil-based ink is a dispersion comprising color particles which
 are solid and hydrophobic at least at ordinary temperature dispersed
 in a nonaqueous solvent having an inherent electrical resistance
 of $10^9 \Omega\text{-cm}$ or more and a dielectric constant of 3.5 or less.

10 ^{48 >} 37. The printing apparatus according to Claim 35 or 36,
 wherein the image forming means includes a device for fixing the
 ink.

15 38. The printing apparatus according to any one of Claims
 35 to 37, further comprising dust removing means for removing dust
 present on the surface of the printing medium before and/or or
 during the printing onto the printing medium.

20 39. The printing apparatus according to any one of Claims
 35 to 38, wherein when recording onto the printing medium, the
 image is recorded via the printing medium by causing the printing
 medium to move by rotating an opposed drum, which is disposed at
 the position opposed to the recording head.

25 40. The printing apparatus according to Claim 39, wherein

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the image is recorded by causing said recording head to move in an axial direction of said opposed drum.

Sub ~~A~~ B24 41. The printing apparatus according to Claims 35 to 38, wherein when recording onto the printing medium, the image is recorded by causing said printing medium to move with the same pinched by at least a pair of capstan rollers.

42. The printing apparatus according to Claim 41, wherein the image is recorded by causing said recording head to move in the direction orthogonal to a traveling direction of said printing medium.

A10 43. The printing apparatus according to any one of Claims 35 to 42, wherein the ink jet recording device includes ink supplying means for supplying the oil-based ink into the recording head.

44. The printing apparatus according to Claim 43, further comprising ink recovering means for recovering the oil-based ink from the recording head, wherein the ink circulation is carried out.

A11 45. The printing apparatus according to any one of Claims 35 to 44, wherein the ink jet recording device includes ink stirring

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47. The printing apparatus according to any one of Claims
10 35 to 46, wherein the ink jet recording device includes ink
concentration controlling means for controlling the concentration
of the oil-based ink.

48. The printing apparatus according to any one of Claims 15 to 47, further comprising cleaning means for cleaning the recording head.

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